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THESIS

EVALUATION OF THE LITTORAL COMBAT SHIP (LCS)
AND SPARTAN SCOUT AS INFORMATION OPERATIONS
(IO) ASSETS

by

Joseph M. Bromley

March 2005

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EVALUATION OF THE LITTORAL COMBAT SHIP (LCS) AND SPARTAN
SCOUT AS INFORMATION OPERATIONS (IO) ASSETS

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ABSTRACT

This thesis will address the planned configuration of Lockheed Martin's Flight Zero, Module Spiral Alpha Littoral Combat Ship (LCS) and the ongoing development of the SPARTAN SCOUT, one of the Navy's Unmanned Surface Vessels (USV). Technology currently available as well as developmental technologies will be recommended for implementation in order to make the LCS and SCOUT assets to Information Operations (IO) objectives. Specific technology will include Outboard, TARBS, HPM, Loudspeakers, LRAD and Air Magnet. This thesis will include an evaluation of the current policy for authorizing Information Operations missions, specifically in Psychological Operations (PSYOP).

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I. INTRODUCTION

Information is the currency of victory on the Battlefield.

General Gordon Sullivan
Former Army Chief of Staff

A. AREA OF RESEARCH

This thesis will address the planned configuration of Lockheed Martin's Flight Zero, Module Spiral Alpha Littoral Combat Ship (LCS) and the ongoing development of the SPARTAN SCOUT, one of the Navy's Unmanned Surface Vessels (USV). Technology currently available as well as developmental technologies will be recommended for implementation in order to make the LCS and SCOUT assets to Information Operations (IO) objectives. This thesis will include an evaluation of the current policy for authorizing Information Operations missions, specifically in the areas of Psychological Operations (PSYOP) and Electronic Warfare (EW).

B. RESEARCH QUESTIONS

To what degree, if any, can the Littoral Combat Ship (LCS) effectively become an asset to Information Operations? To what degree, if any, does the inclusion of the LCS' employment of the SPARTAN SCOUT (USV) affect the LCS' ability to support IO missions?

In conducting this analysis, this thesis will address the following questions:

1. How are the LCS and SPARTAN SCOUT currently configured in support of IO missions?

2. Could each be reconfigured in order to support additional IO missions?
3. Should either be reconfigured in order to support IO missions based on cost versus perceived benefits?
4. If the LCS and SPARTAN SCOUT could be used for IO are there existing assets that could provide better IO coverage?
5. If the LCS and SPARTAN SCOUT could be assets to IO objective how would current IO doctrine (i.e. approval process) need to change?

C. DISCUSSION

According to the Joint Information Operations Planning Handbook, "IO involves actions taken to affect adversary information and information systems while defending ones own information and information systems."¹ There is little argument that in recent conflicts there has been more emphasis placed on Information Operations and in turn, Information Warfare. In Operations DESERT SHIELD and DESERT STORM in 1991 the Joint Force Commanders Psychological Operations campaign proved most effective in convincing a very large number of Iraqi solders to surrender without a fight.

As the future of IO is conceptualized on the premise that modern and emerging technologies, particularly information specific advances, will make possible a new level of joint operations capability, it is only appropriate to evaluate the latest class of naval ships and the latest progress in USV development.² This point is

¹ CJCS. *Joint Information Operations Planning Handbook* (Washington DC: U.S. Government Printing Office, 2002), I-1.

² CJCS. *Joint Information Operations Planning Handbook* (Washington DC: U.S. Government Printing Office, 2002), I-7

further illustrated by the Joint IO Planning Handbook which states, "Underlying a variety of technological innovations is information superiority - the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same."³ The LCS is in development with Lockheed Martin's (LM) flight zero scheduled to begin sea trials in December of 2006. The SPARTAN SCOUT is also in development having just completed its Advanced Concept Technology Demonstration (ACTD), under the direction of the Naval Undersea Warfare Center Division, Newport. As both the LCS and SPARTAN SCOUT are in the development phase, a review of currently planned IO configurations and recommendation for future IO module development is entirely appropriate at this time.

This thesis will evaluate whether the LCS could be configured to conduct Information Operations. It will evaluate the complexity of the configuration as compared to the potential IO benefits. This evaluation will suggest whether or not the LCS should become an asset configured to accomplish IO objectives. Following the evaluation of the organic components of the LCS, we will conduct a similar evaluation of adapting the SPARTAN SCOUT to conduct IO missions. If it is determined that the LCS and SPARTAN SCOUT would be viable assets to IO, we will evaluate if there are existing assets that would be able to provide comparable or better IO coverage. If it is determined that either the SCOUT and/or the LCS could and should, be

³ CJCS. *Joint Information Operations Planning Handbook* (Washington DC: U.S. Government Printing Office, 2002), I-10

configured for Information Operations, this thesis will review current IO mission approval doctrine and make suggestions to adapt the process in order to fully take advantage of the quick response capabilities of the LCS and SPARTAN SCOUT.

D. BENEFIT OF THE STUDY

This thesis' review of potential IO missions for the LCS and SPARTAN SCOUT could aid in the development of LCS flight one and beyond as well as future development of USVs.

E. ROADMAP OF THESIS: A CHAPTER OUTLINE

This thesis is organized in six chapters. Chapter II provides background on the development of both the LCS and the SPARTAN SCOUT. This chapter will serve as the basis for illustrating the current IO configuration of the LCS and SPARTAN SCOUT. In addition, this chapter will introduce aspects of each platform that could be used to support IO missions. These aspects such as speed and maneuverability will be discussed in depth in later chapters.

Chapter III discusses the feasibility and projected benefits of developing an IO module for the LCS. It will illustrate how currently employed technology could be added to the LCS sea frame to make the LCS a viable IO tool in support of IO missions. In addition, it will illustrate how the inherent aspects of the LCS could be exploited to make the LCS an asset to IO missions. This chapter will also

include reasoning as to why the LCS provides unique benefits in support of IO missions that are currently covered by other platforms.

Chapter IV discusses the reconfiguration of SPARTAN SCOUT for IO, much like Chapter III did for the LCS. It will discuss how the inherent aspects of the SPARTAN SCOUT would make it a valuable asset to IO missions.

Chapter V provides background on the current IO doctrine that governs the approval for IO missions, specifically PSYOP. It will illustrate how this current process would not fully take advantage of the response speed that the LCS and SPARTAN SCOUT could provide in rapidly developing IO situations and make recommendations for policy change.

Chapter VI is the conclusion to the thesis. It summarizes the study and provides suggestions for further research.

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II. LITTORAL COMBAT SHIP (LCS) AND SPARTAN SCOUT DEVELOPMENT

Small network combatants have an important role to play in 21st century naval warfare, and the reconfigurable Littoral Combat Ship may make important warfighting contributions as part of the Navy's 21st century "Total Force Battle Network" (TFBN).⁴

Robert O. Work
Center for Strategic and Budgetary Assessments

A. LCS OVERVIEW

The development of the LCS became a program of record in November of 2001 when the Navy announced it would issue a revised Request for Proposal (RFP) for its future surface combatant program. In this proposal the development of three surface combatants; the DDX, CGX and LCS was authorized. From its inception, the LCS development process would be like no other Navy or DOD program. The development would be in spirals and ensure a shift to open architecture. Spiral development allows for the product to get to the field faster and allows industry the ability to incorporate new technology. The government writes contracts identifying the capabilities needed, but not the end requirement, industry then decides how to meet these capabilities. With spiral development the Navy program office would maintain a tight feedback loop with its contractors, designing the solution piece by piece.⁵ Also,

⁴ Robert O. Work, "Naval Transformation and the Littoral Combat Ship" (Center for Strategic and Budgetary, working paper of government LCS design team, 2004). 9.

⁵ Joab Jackson, "Pentagon Backs Spiral Development." Washington Technology, 9 June 2003. Database on-line. Available from URL: www.Washingtontechnology.com/news/18_5/cover-stories/20872-1.html.

The diagram illustrates the LCS Design Concept as a modular assembly process. At the top left is the U.S. Navy Seal. The main title is "LCS Design Concept".

The assembly process is shown in five stages from left to right:

- Fast, Maneuverable, Shallow Draft Hull**: Represented by a blue hull block.
- Total Ship Computing Environment**: Represented by a green circuit board block.
- Air & Watercraft Capability**: Represented by a grey and white block with a helicopter.
- Core Systems**: Represented by a white block with colorful internal components.
- Core Crew**: Represented by a group of blue crew figures.

Below these stages is a long horizontal line of small circles labeled "Interface".

Below the interface line, the components are further detailed:

- Mission Systems**: Includes Fuel, Radar, and Maint. & Support blocks.
- Mission Modules**: Includes VTUV (No. 30) Fireout, a yellow block, and a red-bordered box containing various mission modules.
- Mission Crew**: Represented by a group of blue crew figures.

On the right side, a vertical blue bar contains the text "SEAFRAME" and "LCS". Below this is a red cube labeled "MIW" (Mission Intensive Warfare) and the text "MISSION PACKAGE".

Two boxes on the right list capabilities:

- Core Capabilities**: MOB, SOF, ISR, MIO, HLD, AT/FP.
- Focused Capabilities**: MIW, ASW, SUW.

At the bottom left, it says "Navy Lecture Series, NPS, Monterey, CA, 19 August 2004". At the bottom right is a small number "5".

FIGURE 1. LEGO ® CONCEPT OF DESIGN FOR LCS⁶

These modules are being designed with the requirement that

Accessed 3 February 2005.

⁶ Jason Pawley, "Littoral Combat Ship: Overview" (Presented at Menneken Lecture Series, Naval Postgraduate School, Monterey, California, 19 August 2004.) 5.

the ship can be completely reconfigured for a different mission within three days. According to Captain Donald Babcock, U.S. Navy, the LCS Naval Sea Systems Command (NAVSEA) Program Manager, the development and employment the LCS is like playing with LEGO's. The core will be standing by to receive additional blocks (modules). Unlike the LEGO's that are used in figure 1, the actual mission modules will be delivered in standard sized cargo containers. These containers are lowered through a door in the flight deck into the mission module area. The Reconfigurable Mission Systems Interface Control Document (ICD) for the Littoral Combat Ship (LCS) for Detail Design Phase states:

The LCS platform shall be designed to accommodate multiple reconfigurable modular mission packages to accomplish focused missions via an open and modular design that provides flexibility and ease of upgrade while ensuring rapid and successful installation and integration of the mission packages to the platform. To permit use of a wide range of both present and future mission systems and to permit platform and mission systems to be developed independently, standard interfaces in the form of a standard technical architecture must be used. Industry shall design and build the LCS platform employing an open modular architecture for mission systems based on this standard technical architecture. Separately, mission modules will be developed for the LCS based on this technical architecture.⁷

From this statement comes the next transformational aspect of the LCS development. That is the idea that industry will play a significant role in how this ship is built. The Navy has awarded contracts to Lockheed Martin

⁷ Naval Sea Systems, "Draft (ICD) Interface Control Document" (working paper of government LCS design team, 13 Sep 2004) 5.

and General Dynamics for each company to produce two LCS'. The ships will be produced by each company completely independent of the other. In order to ensure that industry will drive the development of the LCS, the Navy has produced a document called the Capability Development Document (CDD) for Littoral Combat Ship. This CDD provides the desired performance attributes required for each of the contractors to meet in order to produce a LCS. In order to force each contractor to view cost as an independent variable (CAIV) the navy has assigned a 220 million dollar price tag to development, production, and testing of the LCS.



FIGURE 2. LOCKHEED MARTIN VERSION OF LCS⁸



FIGURE 3. GENERAL DYNAMICS VERSION OF LCS⁹

These performance attributes or requirements are very broad in order to provide industry an incentive to exercise as much initiative as possible.

⁸ LCS homepage, Available from URL: www.peos.crane.navy.mil/lcs/Lockheed.htm. Accessed 4 February 2005.

⁹ Ibid.

NAVSEA provided the following requirements to Lockheed Martin (LM) and General Dynamics (GD) regarding the LCS communications package, "LCS Flight 0 will have sufficient communications capability to ensure accurate and timely transmission and reception of multi-media information in coordination with naval, joint and combined forces as well as interagency data (shore sites/facilities), including interaction with those units that rely in whole, or in part, upon voice communications."¹⁰ This is a very generic requirement allowing each contractor the ability to determine how to best achieve the requirement. This open minded development procedure is applied to the sea frame or core as well as the mission modules. In addition to rapid module change out, some specific requirements that the Navy has asked both contractors to provide are a shallow draft of less than 20 feet, speed between 40 (threshold) and 50 knots (objective), and have a nominal endurance of 3,500 nautical miles. As a part of the core systems and specific mission modules, the LCS will be equipped with at least one manned helicopter as well as unmanned aerial vehicles (UAVs), unmanned undersea vehicles (UUVs), and manned and unmanned surface vehicles (USVs). The Lockheed Martin version of LCS is developing a stern ramp for launch and recovery of manned and unmanned boats, an extendable rail system for launch and recovery of USVs and a Talon system¹¹ on the flight deck for recovery of manned and unmanned aerial vehicles.

¹⁰ Naval Sea Systems, "Capability Development Document for Littoral Combat Ship" (working paper of government LCS design team, April 2004) 9-2.

¹¹ The Talon System (also known as in deck light harpoon) is a grid and probe aircraft recovery system that is similar to the system being used for UAV recovery.

B. LCS COMBAT SYSTEMS

The LCS is being designed with a combat system that provides sufficient self defense capabilities that will allow the LCS to operate independently, or as part of a Expeditionary Strike Group (ESG) or Expeditionary Strike Force (ESF). Of interest to this thesis, the combat system will include the ability to transmit and receive on HF, VHF, UHF, SHF and SATCOM. Additionally, the LCS will be equipped with non-secure internet protocol network (NIPRNET), secure internet protocol network (SIPRNET) and joint tactical information distribution system (JTIDS) data connections. As of September 2004, the LM version of LCS is being configured with minimal Electronic Warfare (EW) capability, that being Electronic Support Measures (ESM), to assist in contact identification. The LCS will be equipped with an electro-optical infrared scanner designed mainly for use in identifying surface contacts, but will have the ability to assist Naval Surface Fire Support (NSFS) in splash spotting and battle damage assessment (BDA).

C. SPARTAN SCOUT OVERVIEW

SPARTAN SCOUT meets a need for ship force protection... SPARTAN SCOUT can provide surveillance in a harbor, not only for Navy ships but also U.S. Coast Guard units responsible for port security. It can be modified for mine detection or anti-submarine warfare.

Rear Adm. James Stavridis
Commander of the Enterprise Strike Group¹²

¹² Naval Undersea Warfare Command Public Affairs Officer, "Spartan Deployed on Gettysburg," Navy News Stand, 23 December 2003. Available from URL: http://www.news.navy.mil/search/display.asp?story_id=10964. Accessed 19 February, 2005.



FIGURE 4. SPARTAN SCOUT TEST BED MODEL¹³

The USV that will be deployed on at least the first LCS will be the SPARTAN SCOUT. As of September 2004, there was still debate regarding the future development of USV's for the Navy. This debate is between Naval Undersea Warfare Center who designed the SCOUT and the Office of Naval Research who in conjunction with the Surface Warfare Center of NAVSEA is designing a USV called the Unmanned Sea Surface Vehicle (USSV). The major difference between the SCOUT and the USSV is that the USSV will be built as an unmanned vehicle from the ground up, where as the SCOUT is simply a seven or eleven meter rigid hull inflatable boat

¹³ Pat Holder, "SPARTAN SCOUT ACTD Unmanned Surface Vessel for Assured Access and Force Protection" (presentation presented at Logistics from the Sea Symposium, Washington DC, 4-7 February 2003).

(RHIB) modified for unmanned operations. As the SCOUT will be the USV on the first LCS, it will be the USV considered in this study.

The SCOUT was designed to be an integrated weapon system and a primary force leveler against asymmetric threats, enabling the battleforce commander to match lesser threats with an appropriate, inexpensive response.¹⁴ According to the Advanced Concept Technology Demonstration (ACTD) management plan the SCOUT will be an additional asset to the warfare commander with the capability to conduct critical missions (MIW, ISR/FP, SUW), prepare the water space for sealift operations, and when launched or operated from shore, provide port protection. The management plan goes on to say that the SCOUT has the potential to benefit the warfighter by extending the range of detecting a threat, providing the ability to establish defensive barriers, minimize the risk to personnel and capital assets and serve as a force multiplier or leveler.¹⁵ It is important to note that the management plan does not address the use of SCOUT for Information Operations (IO) missions. The main focus for the SCOUT as with all Naval USV's has been in the mission areas of force protection, MIW and SUW.

The SCOUT, like LCS, will be built with a modular design and in several spirals. The core of the SCOUT will

¹⁴ Naval Undersea Warfare Command, "SPARTAN SCOUT ACTD Management Plan Rev 1" (Working paper for SPARTAN SCOUT design team, 14 March 2003) 1.

¹⁵ "SPARTAN SCOUT ACTD Management Plan Rev 1", 6.

be capable of carrying payloads of 3,200 lbs for the seven meter model and approximately 5,000 lbs for the eleven meter model.¹⁶

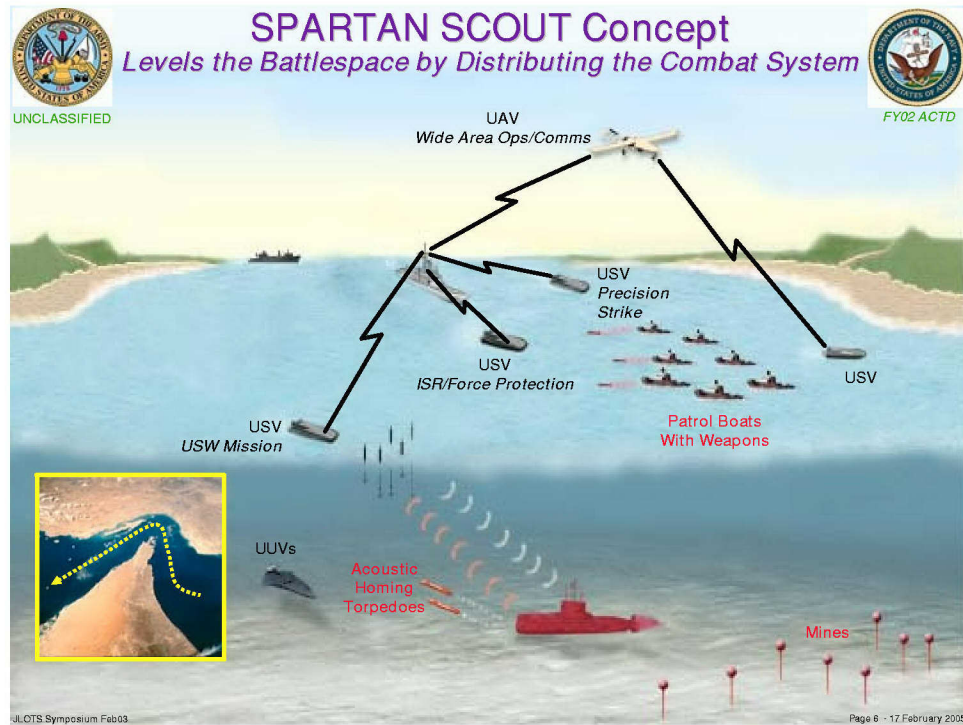


FIGURE 5. SPARTAN SCOUT BLOS COMMUNICATIONS¹⁷

Beginning in fiscal year 2006, the third spiral or version of the SCOUT should be completed and capable of conducting missions such as Intelligence, Surveillance, and Reconnaissance (ISR) and Force Protection (FP) using an Integrated Radar Optical Sighting System (IROSS) coupled with a 7.62mm gattling gun (GAU-17) for moving targets, MIW using an AQS-14 Side Scan Sonar, SUW employing the Hellfire/Javelin Missile for moving targets at sea, and C3 (Command, Control and Communication) extending Beyond the

¹⁶ Surface Warfare Magazine, Summer 2004, Vol 29, No 3 Pg 39.

¹⁷ Holder "SPARTAN SCOUT ACTD Unmanned Surface Vessel for Assured Access and Force Protection", 2003.

line of sight capability.¹⁸ As seen in Figure 5 the SCOUT will have three options in extending it's beyond Line-of-Sight (BLOS) communications out to 100 nautical miles. It will be cable of relaying communications through manned and unmanned aerial vehicles, manned and unmanned surface vehicles as well as through satellites.

¹⁸ "SPARTAN SCOUT ACTD Management Plan Rev 1", 6.

III. CONFIGURATION OF LCS FOR IO

Generally, in battle, use the normal force (direct approach) to engage; use the extraordinary (indirect approach) to win.

Sun Tzu, The Art of War.

A. INTRODUCTION

With the first LCS Flight Zero model scheduled for delivery in December of 2006 now is the time to recommend any modifications that could be incorporated into the final design of the sea frame. In exploring how the LCS' sea frame could be configured to support IO missions, one must first start with systems that are already in existence.

B. OUTBOARD AN/SSQ-108

The Classic OUTBOARD (Organizational Unit Tactical Baseline Operational Area Radio Detection) countermeasures exploitation system, AN/SSQ-108(v), could be added to the design of LCS. OUTBOARD is a U.S. Navy shipboard combat direction finding system that has historically been installed in Guided Missile Destroyers and Cruisers. OUTBOARD provides electronic warfare signals acquisition and direction finding systems with the capability to detect, locate, and identify hostile targets at long-ranges, and input this information into the shipboard tactical data system. With the introduction of the more cost effective LCS (a ship designed to operate closer to shore) adding the OUTBOARD system would be a justifiable modification. Because LCS will operate closer to shore the ability to intercept signals would be improved over the

distantly operating DDG or CG. Because the LCS cost a fraction of what the DDG or CG cost to produce it would free these high priced, high value assets from the OUTBOARD missions for other critical core missions.

C. AFLOAT PRINT PRODUCTION SYSTEM (APPS)

Another proposed configuration change for the LCS is the development of an IO module. Similar to the other warfare area modules (e.g. MIW, SUW, ASW) the LCS could be configured with the IO module when specifically tasked to conduct IO related missions. This IO module would contain equipment required for leaflet production such as the Afloat Print Production System (APPS) that has been successfully used by USS CONSTELLATION (CV 64) and USS FORT MCHENRY (LSD 43).

In response to the Carrier Battle Group's Information Warfare Commander's (IWC) request the Fleet Information Warfare Command developed and installed the prototype APPS on USS CONSTELLATION prior to her 2003 deployment. This APPS consists of two Risograph duplicators, two Dell laptop computers and one heavy-duty paper cutter. This equipment provides the high speed (120 pages per minute) and high volume (86,000 single color leaflets per hour) required to produce PSYOP leaflets for distribution.¹⁹ These shipboard produced leaflets were distributed via the PDU-5/B bomb dropped from Carrier Airwing aircraft. While the number of personnel that were involved in this evolution is unclear, the results of this exercise displayed that the entire

¹⁹ John Solt, "Psychological Operations Go to Sea" FIWC INFOSCOPE Winter 2003, Volume 2, Issue 1. Available from FIWC website at URL: http://www.infoscope.fiwc.navy.smil.mil/vol2_issue2/index.htm. Accessed 12 October, 2004.

process of producing, cutting, rolling, and loading 100,000 leaflets into a PDU-5/B could be accomplished in approximately 12 hours.²⁰

D. COMMANDO SOLO

In addition to the APPS equipment an LCS IO module would include radio and television broadcast equipment much like what is found in the EC-130 COMMAND SOLO aircraft.²¹



FIGURE 6. EXAMPLE OF ACTUAL LEAFLET USED IN AFGHANISTAN.²²

Translation: STOP! TURN AWAY NOW!

"The Partnership of Nations has secured the Qandahar Airport to ensure that Humanitarian Aid will reach the people of this area for your own safety please stay away"
HELP US KEEP YOU SAFE

²⁰ Solt, "Psychological Operations Go to Sea".

²¹ 193rd Special Operations Wing (ANG), Harrisburg, PA.

²² Available from the PSYWARRIOR website.

URL: [http:// www.psywarrior.com](http://www.psywarrior.com). Accessed 15 February 2005.

Again, with a majority of the LCS missions being conducted in the littorals and closer to shore, these radio and television broadcasts could be tailored and focused to reach a more specific audience. For example, several days prior to a fleet of ships entering a port where security may be an issue the LCS operating in close proximity to the port could broadcast warnings regarding the ships mission and the consequences to an enemy if the ships are attacked. In addition, the LCS leaflet production capability could be used to deliver focused leaflets to this specific port, much like what was done at the Qandahar Airport during Operation ENDURING FREEDOM (Figure 6).

While it is true that COMMANDO SOLO (Figure 7) has been and will continue to be a primary asset that is tasked to deliver focused messages in support of the Joint Force Commanders campaign plan, there are certain unique benefits that a broadcast system onboard the LCS provides the warfare commander.



FIGURE 7. EXTERIOR AND INTERIOR VIEW OF COMMANDO SOLO²³

²³ American Forces Information Services website. Available from: <http://www.iwar.org.uk/psyops/resources/afghanistan/commando-solo.htm>. Accessed 17 February 2005.

According to a COMMANDO SOLO commander, the EC-130 has been called a 'weapon of mass persuasion'. Equipping the LCS for the mission of PSYOP broadcast would allow focused and localized messages to be delivered over longer time periods. By keeping the broadcast area limited the message being delivered can be tailored to appeal to the target group without the fear of offending other groups. The on-station time is increased when using a broadcast from the LCS as compared to that of COMMANDO SOLO and the LCS does not have the concern of access to ports within a mission radius which may limit COMMANDO SOLO. In addition, it simply makes sense and is cost effective to use the equipment that is already available and that has been operationally validated.

E. TRANSPORTABLE AM/FM RADIO BROADCAST SYSTEM (TARBS)

In 2003, in addition to the APPS exercise onboard the USS MCHENRY (LSD-43), a test of the newly developed Transportable AM/FM Radio Broadcast System (TARBS) was conducted off the coast of Okinawa. During this test, messages produced by the 4th Psychological Operations Group (POG) were able to be broadcast to target audiences in the littorals.²⁴ According to Joint Publication 3-53 Doctrine for Joint Psychological Operations:

TARBS is comprised of an audio transmitter and antenna subsystems capable of operations ashore or afloat. When needed, TARBS will broadcast voice information as directed and authorized by the Joint Force Commander (JFC). PSYOP broadcast information products will be produced for the JFC by the 4th POG (Airborne) or the JPOTF supporting the JFC, and forwarded to the TARBS operators for

²⁴ Solt, "Psychological Operations Go to Sea".

final dissemination. The products will be forwarded either electronically to the TARBS laptop computer or by other means as necessary (e.g., cassette and compact disc-read only memory). Once authorized by the JFC, the TARBS operators will conduct both AM and FM broadcasts of this product on designated frequencies.²⁵

Joint Publication 3-53 goes on to say, "TARBS ideally will be installed onboard one ship in each amphibious ready group."²⁶ As the LCS is being designed to assist in reducing the role of the U.S. Navy's aging amphibious fleet it only makes sense that TARBS be included in an LCS IO Module. As TARBS is designated as a portable system divided into three subsystems, mostly contained in a transportable shelter 173 inches long, 86 inches wide, and 84 inches high, with an approximate loaded weight of 9,600 pounds it could easily be configured to fit into the IO module in the LCS.²⁷

F. HIGH POWER MICROWAVE (HPM) AND ELECTROMAGNETIC PULSE (EMP)

In the realm of emerging technology, the addition of the developmental High Power Microwave (HPM) and Electromagnetic Pulse (EMP) weapons would provide the ability for the LCS to be an asset for offensive IO missions. The development of HPM devices is of interest to many different communities, specifically the Department of Defense (DoD), the Department of Energy (DoE), and the Electromagnetic Compatibility (EMC) community. For the DoD interests there are ultra-wide and narrowband applications.

²⁵ CJCS. *Joint Doctrine for Psychological Operations* (Washington DC: U.S. Government Printing Office, 2003), A-4.

²⁶ Ibid.

²⁷ Ibid.

Narrowband technology operates in the 1 to 100 GHz range, and the ultra-wideband operates in the 10 MHz to 10 GHz range. The production of narrow and ultra-wideband pulses require different power sources and produce significantly different results. Narrowband pulses are extremely precise and are able to be aimed at a specific target; analogous to a laser. Ultra-wideband pulses provide coverage to large areas; analogous to a flash bulb.²⁸

The main application for the ultra-wideband technology that is being developed by the DoD is for active non-lethal denial purposes in crowd control. The DOD is developing narrow band technology for electronic attack purposes. As narrowband is the technology that would provide the LCS with an Electronic Warfare (EW) capability we will focus on it's application. Figure 8 shows a block diagram of how a narrow band pulse is produced. While still under development the inclusion of this HPM equipment in an IO module would allow the LCS to direct an antenna toward a target located miles away and with the precision of a laser conduct an electronic attack. This narrowband weapon is able to penetrate concrete bunkers and would be effective even on equipment that has been shielded from nuclear produced Electromagnetic Pulses (EMP).²⁹

²⁸ E. Schamiloglu, "High Powered Microwave Sources and Applications". IEEE MTT-S Digest, (2004): 1000.

²⁹ Michael Abrams, "The Dawn of the E-bomb", IEEE Spectrum (November 2003): 26.

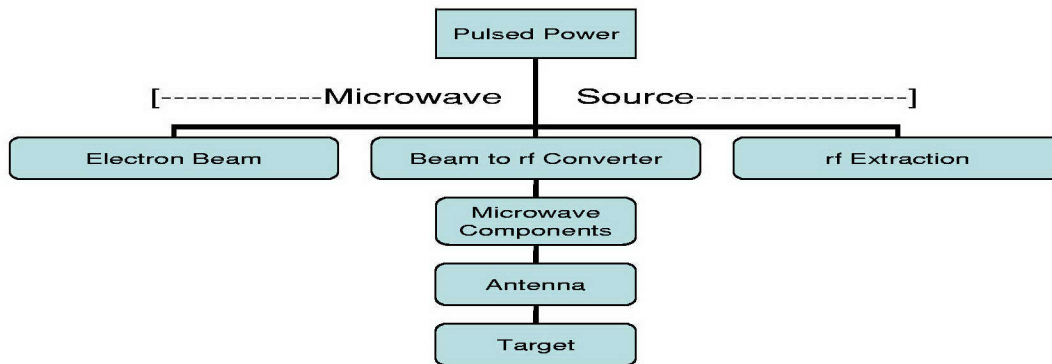


FIGURE 8. HPM NARROWBAND PRODUCTION BLOCK DIAGRAM³⁰

Pulsed power is the technology that converts some prime power source (whether the line voltage in the laboratory, jet turbine on an aircraft, or battery pack on an unmanned drone) into a short, properly tailored, high voltage pulse. High voltage capacitors, together with fast switching techniques, are typically used to accomplish this. Once the pulse power portion of the system produces the desirable high voltage waveform, it is applied to an electron gun, also known as an electron beam diode. The electron beam diode produces a high perveance electron beam where space-charged effects dominate the interaction. The relativistic electron beam, once generated, propagates through a radio frequency (rf) interaction region, which converts the beam's kinetic energy into HPM.³¹

Another non-kinetic weapon in development that would provide the LCS the ability to conduct offensive EW missions is the E-bomb. While figures 9 and 10 provide the anatomy of a theoretical E-bomb, there is speculation that the E-bomb was tested in the early days of Operation IRAQI FREEDOM.

³⁰ Schamiloglu, "High Powered Microwave Sources and Applications," 1001.

³¹ Ibid., 1002-1003.

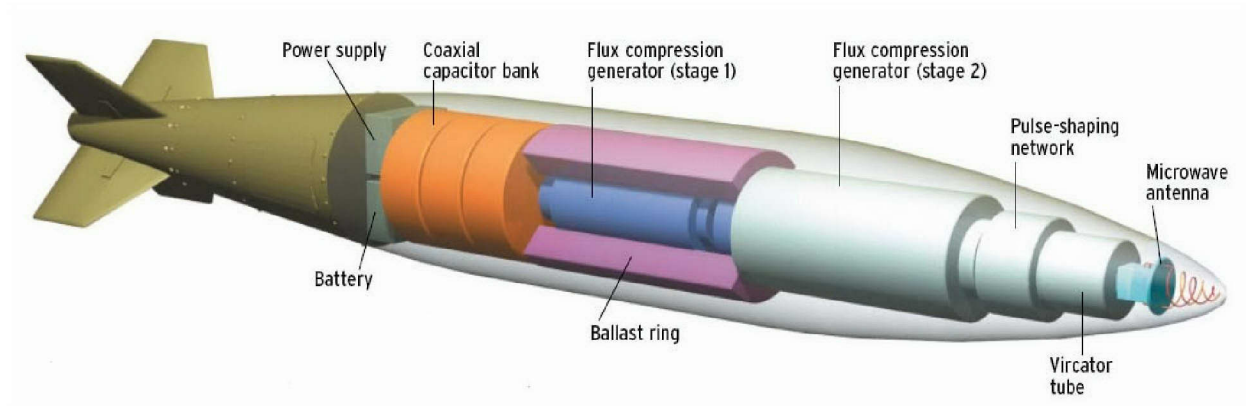


FIGURE 9. DIAGRAM OF AN E-BOMB³²

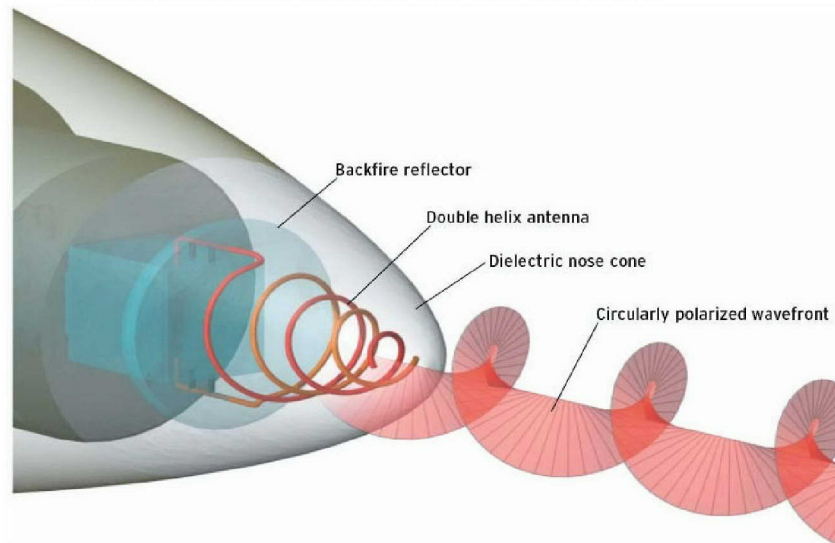


FIGURE 10. DIAGRAM OF E-BOMB NOSE CONE³³

According to a Time magazine article written by Mark Thompson in January of 2003, the use of microwave weapons would be one of the legacies of the second Gulf War.³⁴ After seeing footage of a U.S. bomb destroying an Iraqi television studio, Howard Seguire, an expert on emerging weapons technology with Decisive Analytics Corporation said, "I saw the detonation, and then saw the burst-which

³² Abrams, "The Dawn of the E-bomb," 25.

³³ Ibid.

³⁴ Mark Thompson, "America's Ultra-Secret Weapon". *Time*, (January 27, 2003. Volume 161 Number 4).

wasn't much. If they took the station out with that blast, I strongly suspect that we used Iraq as a proving ground for HPMs."³⁵ As seen in Figure 11, Dr. Schamiloglu³⁶ is holding a wave guide and antenna capable of producing high power microwaves. This HPM technology exists and should be part of a LCS IO module.

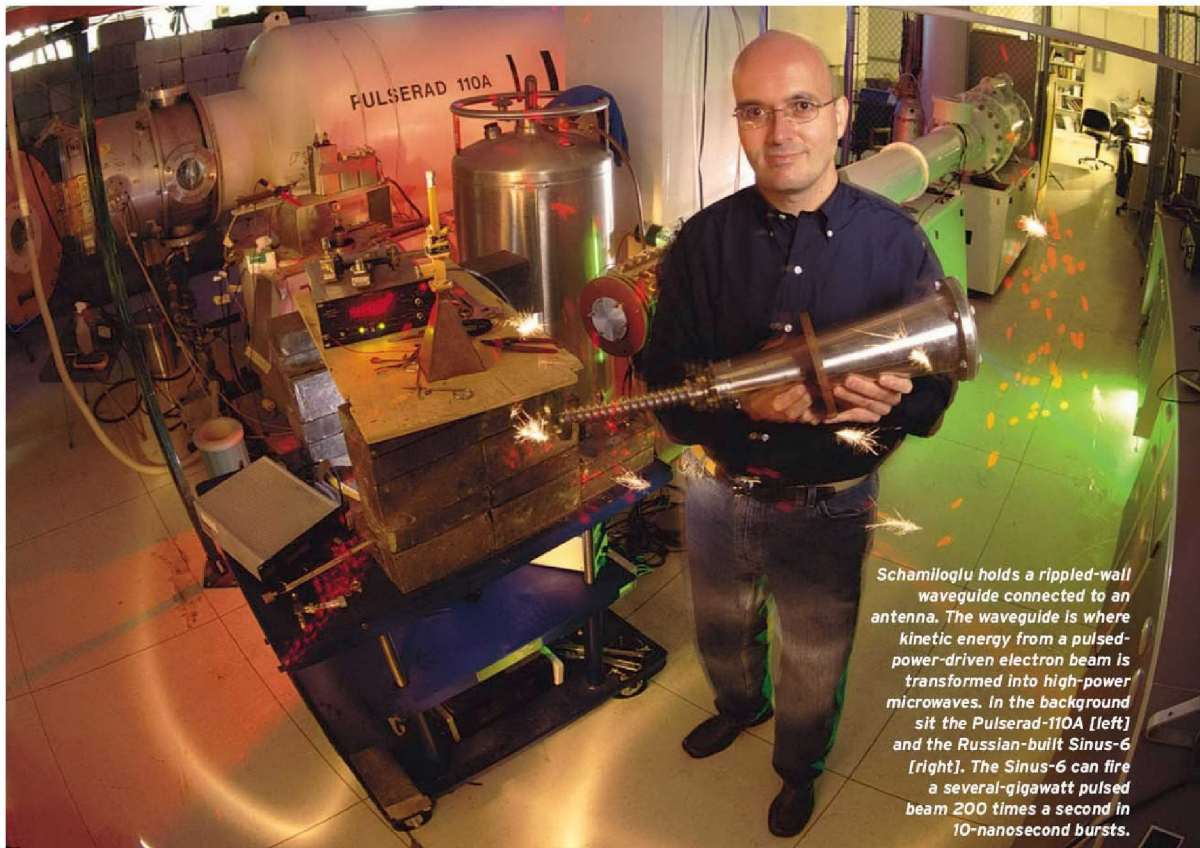


FIGURE 11. ACTUAL HIGH POWER MICROWAVE EQUIPMENT³⁷

G. MODULE MANNING

The Goldwater-Nichols Act of 1986 strengthened the concept of joint operations with the DoD. In the 2001 Quadrennial Defense Review Report (QDR) the Secretary of Defense directed that all branches of the Armed Forces

³⁵ Abrams, "The Dawn of the E-bomb," 26.

³⁶ Leading Electromagnetic expert from the University of New Mexico.

³⁷ Abrams, "The Dawn of the E-bomb," 26.

provide a roadmap illustrating how they will become a transformational force. Also included in the 2001 QDR was this direction for joint operations:

To better meet future warfare challenges, DoD must develop the ability to integrate combat organizations with forces capable of responding rapidly to events that occur with little or no warning. These joint forces must be scalable and task-organized into modular units to allow the combatant commanders to draw on the appropriate forces to deter or defeat an adversary. The forces must be highly networked with joint command and control, and they must be better able to integrate into combined operations than the forces of today.³⁸

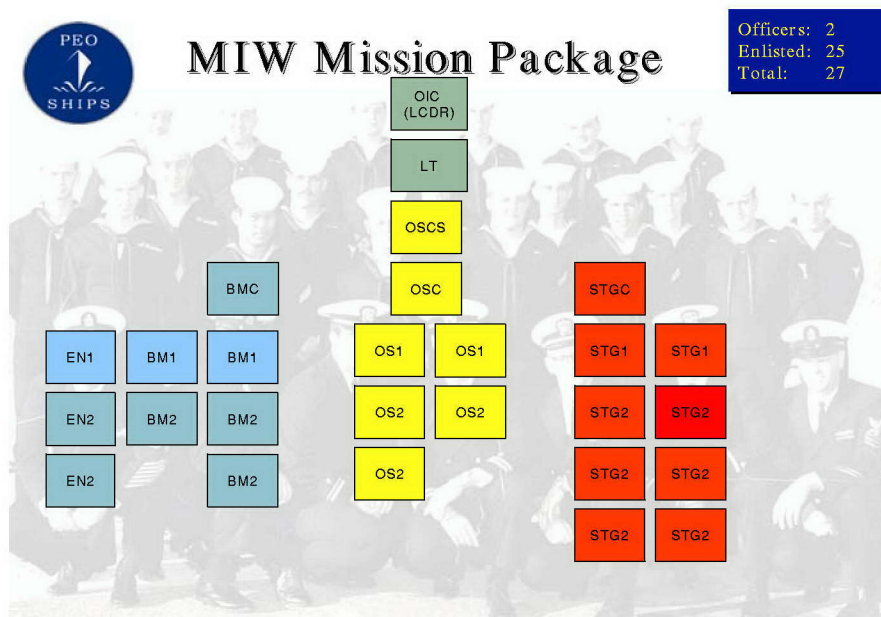


FIGURE 12. EXAMPLE OF PROPOSED MINE WARFARE MANNING³⁹

³⁸ Donald Rumsfeld, *Quadrennial Defense Review*. (Washington DC: Government Printing Office, 2001), 32.

³⁹ Rob Abbott, *LCS Mission Package Manning Overview*. (Washington DC: PEO Ships, 2005).

Current mission module manning for LCS consists of all naval personnel (Figure 12). As no one branch of the armed forces is the IO authority and in keeping with the Secretary of Defense's direction, the manning for a LCS IO module would optimally consist of members of the Army, Air Force and Navy. Air Force personnel would be provided by the 67th Information Operations Wing (IOW), who for the past ten years have led the charge in executing the next order of battle on the information highways.⁴⁰ In addition to Air Force technicians the IO module would include a junior officer to act a liaison with the Information Warfare Flight (IWF) and the Air and Space Operations Center (AOC). According to Air Force IO doctrine, in times of war the IWF becomes the Air Force's key IO expertise whereas the AOC typically is the main organizational structure through which the capabilities of EW operations, net warfare (NW) operations and influence operations planning and execution are integrated and synchronized.⁴¹

Members of the Army's Psychological Operations Groups (POG), specifically the 4th POG, would make up part of the IO module. According to Army literature, the 4th POG (Airborne) at Fort Bragg, North Carolina, is the only active psychological operations unit, constitutes 26 percent of all U.S. Army psychological operations units.⁴² Similar to the Air Force manning, in addition to

⁴⁰ Bruce Bingle, "67th IOW Crystallizes Operations" Available from URL: <http://aia.lackland.af.mil/homepages/pa/spokesman/jun04/cc.cfm>. Accessed 23 February 2005.

⁴¹ Secretary of the Air Force. Information Operations AFDD 2-5 (Washington DC: U.S. Government Printing Office, January 11, 2005), 33.

⁴² Herbert L. Altshuler. United States Army Civil Affairs and Psychological Operations Command. Available from URL: <http://www.soc.mil/usacapoc/psyopfs.shtml>. Accessed 23 February 2005.

technicians a junior officer would act as a liaison to coordinate with The U.S. Army Civil Affairs and Psychological Operations Command (USACAPOC). USACAPOC, headquarter at Fort Bragg, North Carolina, is a subordinate command of U.S. Army Special Operations Command (USASOC).⁴³

In addition to a module Officer In Charge (OIC) and technicians, the Navy would provide a junior officer to act as a liaison with the Naval Information Warfare Activity (NIWA). NIWA at Ft Meade is the Navy's principal technical agent to research, assess, develop, and prototype Information Warfare (IW) capabilities.⁴⁴ Figure 13 shows the proposed members of the IO module team onboard the LCS that would be in support of the Joint Force Commander (JFC) .

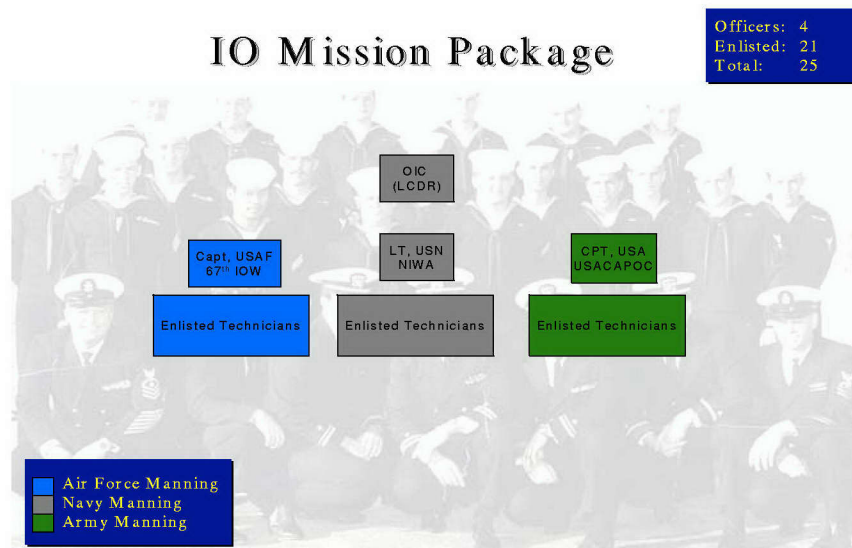


FIGURE 13. PROPOSED IO MODULE MANNING

⁴³ Herbert L. Altshuler. United States Army Civil Affairs and Psychological Operations Command. Available from URL: <http://www.soc.mil/usacapoc/psyopfs.shtml>. Accessed 23 February 2005.

⁴⁴ Federation of American Scientists website. Available from URL: <http://www.fas.org/irp/agency/navsecgru/niwa/>. Accessed 23 February 2005.

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IV. CONFIGURATION OF THE SPARTAN SCOUT FOR IO

The real target in war is the mind of the enemy command, not the bodies of his troops. If we operate against his troops it is fundamentally for the effect that action will produce on the mind and will of the commander; indeed, the trend of warfare and development of new weapons—promise to give us increased and more direct opportunities of striking at this psychological target.

Captain Sir Basil Liddell Hart
Thoughts on War, 1944

A. INTRODUCTION

The SPARTAN SCOUT like the LCS, is still under development making now the optimal time to study and recommend configuration changes. In September of 2004 I visited Dr. Ricci and his SPARTAN SCOUT at the Naval Undersea Warfare Center (NUWC) in Newport, Rhode Island. While Dr Ricci assisted his team in the installation of a mock hellfire missile and actual IROSS gun, Dr. Ricci admitted that, "While we've always understood it could be used in Info Ops, we haven't spent a great deal in development of that concept."⁴⁵ This chapter will provide recommendations to develop an IO module for SPARTAN SCOUT using existing and developmental technologies.

B. LOUDSPEAKERS

The first technology to be considered for an IO module for the SPARTAN SCOUT is the 'tried and true' loudspeaker. Loudspeakers have been used by U.S. forces for PSYOP

⁴⁵ Dr. Vic Ricci, interview by author, Newport, RI. 24 September 2004.

dissemination in every conflict since WWII. They proved to be most effective during Operation JUST CAUSE in Panama where they were credited with reducing casualties on both sides.⁴⁶ According to the Final Report to Congress for the Conduct of the Persian Gulf War:

Loudspeaker teams were used effectively throughout the theater. Each tactical maneuver brigade had loudspeaker PSYOP teams attached. Many of the 66 teams came from the Army Reserve Components. Loudspeaker teams accompanied units into Iraq and Kuwait, broadcasting tapes of prepared surrender messages. Messages were transmitted in Arabic and were developed by cross cultural teams. These messages were similar to those on the leaflets being dropped. Iraqi soldiers were encouraged to surrender, were warned of impending bombing attacks, and told they would be treated humanely and fairly....

...UH-1Ns used loudspeakers and Arab linguists to convince Iraqi soldiers to surrender along the Kuwait border. The message to the Iraqi soldier was that Saddam Hussein was deliberately endangering their religion and families....

...Many Enemy Prisoners of War mentioned hearing the loudspeaker broadcasts in their area and surrendered to the Coalition forces because they feared more bombing.⁴⁷

In May of 2000 the Defense Science Board (DSB) Task Force submitted their report on The Creation and Dissemination of All Forms of Information in Support of Psychological Operations in Time of Military Conflict. The DSB is a Federal Advisory Committee established to provide

⁴⁶ Robert W. Caspers, *Joint Task Force South in Operations Just Cause, An Oral History Interview*. (Washington DC: U.S. Army Center of Military History, 1990), 8.

⁴⁷ U.S. Department of Defense, Office of the Secretary of Defense, *Final Report to Congress for the Conduct of the Persian Gulf War*, April 1992. 192, 623.

independent advice to the Secretary of Defense.⁴⁸ The DSB Task Force was established due to the limitations exhibited in military operations in the Balkans, where the *Commando Solo* (EC 130E) aircraft were unable to effectively disseminate TV and radio broadcasts. The DSB recommended that United States Special Operations Command (USSOCOM) investigate the creation of small and easily reconfigurable information-dissemination packages that would be compatible with multiple platforms, including UAVs and leased aircraft, for a variety of missions.⁴⁹ The report goes on to recommend that future tactical PSYOP teams no longer be loudspeaker teams. The DSB recommended that PSYOP messages be routed through wireless networks to unmanned speakers and that loudspeakers should be mounted on tanks and dropped in the enemy area. The goal being to free the tactical PSYOP units to conduct electronic news and image gathering in order to produce more effective PSYOP material.⁵⁰

While the recommendations of the DSB do not specifically address seaborne application of PSYOP dissemination it is clear that fitting the SPARTAN SCOUT with loudspeakers would comply with the overall intentions of the committee. Another reason to develop loudspeakers for the SPARTAN SCOUT is an ongoing effort by the Marine Corps with respect to loudspeaker systems.

⁴⁸ Defense Science Board (DSB) Task Force, *The Creation and Dissemination of All Forms of Information in Support of Psychological Operations in Time of Military Conflict*. (Washington DC: Government Printing Office, 2000) i.

⁴⁹ Ibid., 4.

⁵⁰ Ibid., 10.

C. LONG RANGE ACOUSTIC DEVICE (LRAD)

In May of 2004, in order to explore non-lethal options for handling force protection, the 24th Marine Expeditionary Unit (MEU) conducted tests on the X-Net, Long Range Acoustic Device (LRAD) and the Vehicle Non-Lethal Munition (VENOM).⁵¹

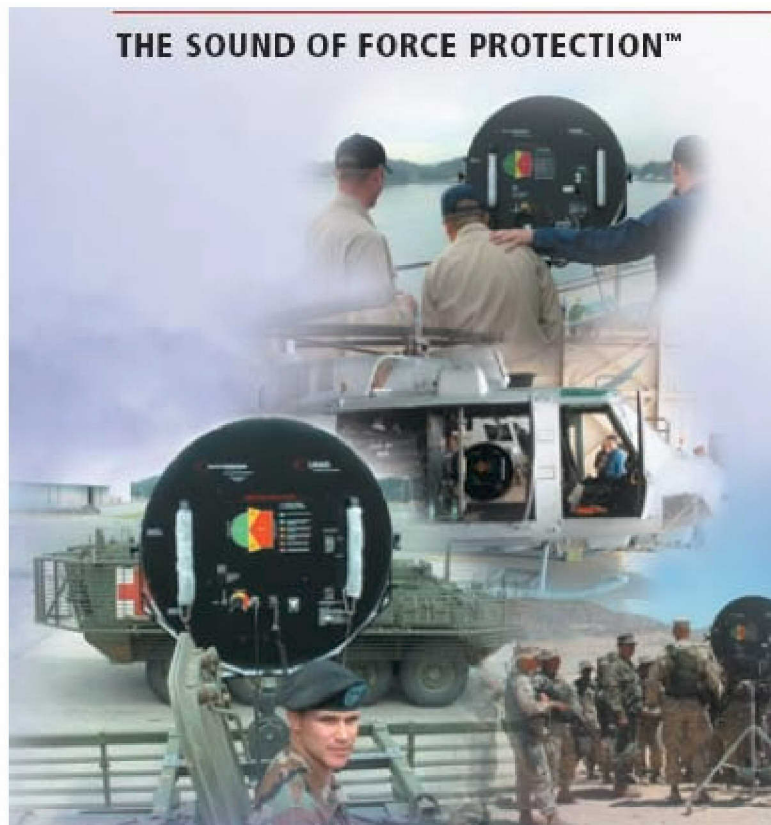


FIGURE 14. EXAMPLES OF LRAD EMPLOYMENT⁵²

The LRAD is an experimental technology that should be considered for incorporation into an IO module for SPARTAN SCOUT. The LRAD is disc shaped loudspeaker being developed

⁵¹ Sara Beavers, "24 MEU Conducts Non-lethal Training During TRUEX" Marine Link, May 2004. Available from URL: <http://www.marines.mil/marinelink/mcn2000.nsf/lookupstoryref/2004525152639>. Accessed 19 February 2005.

⁵² American Technology Corporation. "LRAD: The Sound of Force Protection", Available from ATC website. URL: <http://www.atcsd.com>. Accessed 15 February 2005.

by American Technology Corporation (Figure 14). The LRAD is a 33 inch diameter disc that is capable of clearly delivering a message to a range of more than 500 meters.⁵³ With it's small, lightweight size, and minimum power requirements (Table 1) not only would the LRAD provide excellent PYSOP dissemination capabilities for the SPARTAN SCOUT, it could also be used in a form of electronic attack (EA) .

LRAD 3300 SERIES TECHNICAL SPECIFICATIONS	
WEIGHT :	45 lbs
DIAMETER:	33" diameter x 5" thickness
MAXIMUM SPL TONE:	146dB sustained, 151dB burst at 1 meter
MAXIMUM SPL VOICE:	Less than 120dB sustained, based on individual voice frequencies and harmonic characteristics
REGULATED POWER MODE:	Normal operations, tone limited to 120dB at 1 meter
DURABILITY:	Thermal conditions have minimal effect on system performance. System meets MIL-STD 810 environmental specifications
EMITTER, HARMONIC DISTORTION:	Less than 1% THD at 126dB at 1 meter at 2.5kHz
MAXIMUM POWER HANDLING:	500 watts; 100-240VAC at 50-60Hz, 5 amps at 115VAC
NORMAL POWER USAGE (TONE):	240 watts, 2 amps at 115VAC
DIRECTIONALITY:	-20dB at +/- 15° at 2.5kHz

TABLE 1. LRAD TECHNICAL SPECIFICATIONS⁵⁴

One of the features of the LRAD is the ability to deliver a sound burst of 150dB at a frequency of 2,100 to 3,100 Hertz.⁵⁵ While this sound burst will not completely

⁵³ American Technology Corporation. "LRAD: The Sound of Force Protection".

⁵⁴ Ibid.

⁵⁵ "US Troops Have Sound Weapon," Washington Times, 7 March 2004. Available from URL: <http://www.washingtontimes.com/archive/>. Accessed 19 February 2005.

incapacitate an individual it would provide behavior modification. Adding the LRAD to the IO module of the SPARTAN SCOUT would provide the ability for non-lethal EA. The next technology that should be added to the SPARTAN SCOUT IO module would offer a lethal EA capability. Again we look toward a Marine Corps initiative to develop a mobile phased array electronic attack antenna.

D. COMINT EMITTER SENSING AND ATTACK SYSTEM (CESAS)

In a March 2004 Marine Corps Systems Command (MARCORSYSCOM) message, the Marine Corps delineated what equipment and systems would comprise their C4I needs when a Marine unit embarks a ship. They addressed COMINT Emitter Sensing and Attack System (CESAS), a mobile phased array electronic antenna. According to MARCORSYCOM the CESAS would be a tier three piece of equipment, meaning it would deploy with the MAGTF whenever they embarked a LHD or LHA.

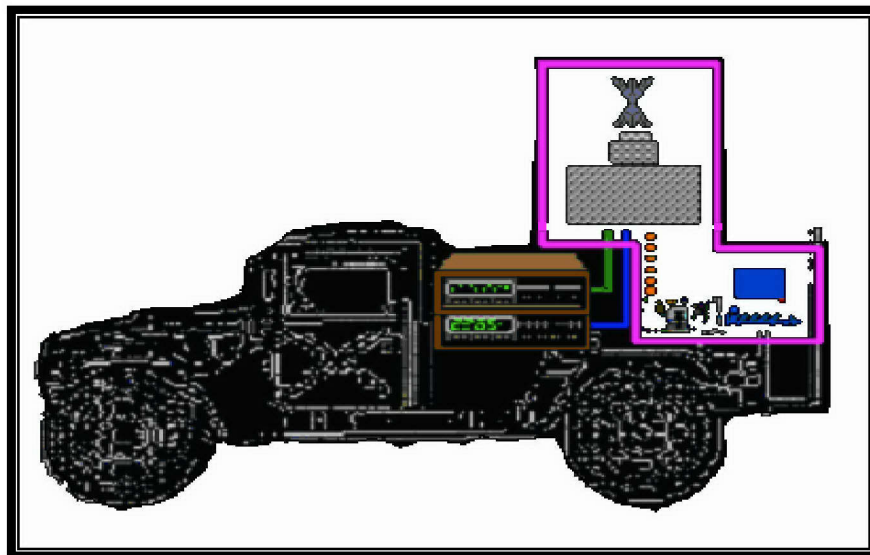


FIGURE 15. OFFICE OF NAVAL RESEARCH CESAS CONCEPTUAL DRAWING⁵⁶

⁵⁶ ONR Future Naval Capabilities website. URL:

CESAS (Figure 15) is a Phased Array Electronic Attack Antenna, operating across a frequency range of 150-2500 MHz, that will enable on-the-move disruption of hostile RF communications by providing a steerable beam of jamming energy while retaining omni-directional receive capability.⁵⁷ According to the Office of Naval Research CESAS is a MARCORSYSCOM program that is being developed by BAE Systems Information and Electronic Warfare Department and is in the prototype and testing phase.⁵⁸

As CESAS' development has already been funded and is scheduled for final delivery in 2006 it would be cost effective to include this technology in an IO module for SPARTAN SCOUT providing another method for engaging in Electronic Attack (EA). Additionally, as the Marine Corps has identified CESAS as equipment that they will deploy with each time they embark a LHA or LHD and as the LCS with SPARTAN SCOUTs are being designed to assist in reducing the role of the U.S. Navy's aging amphibious fleet, it is logical to include CESAS in an IO module for SPARTAN SCOUT.

E. AIR MAGNET

Another tool that should be included in the IO module of SPARTAN SCOUT would be an air magnet or similar device used for mapping Wireless Local Area Networks (WLAN). The inclusion of this technology would provide the ability for the SPARTAN SCOUT to assist in Special Information Operations (SIO) missions that may include Computer Network

<http://www.onr.navy.mil/fncs/explog/litcom/product.asp?productid=65&divisionid=5>. Accessed 2 February, 2005.

⁵⁷ Ibid

⁵⁸ Ibid

Attack (CNA). An Air Magnet as designed is a tool for network administrators to monitor the health of their existing wireless network or for planners to use to develop a wireless network. An additional use for an air magnet is the ability to locate and possibly penetrate existing wireless networks using the 802.11 standard protocol. Once inside the network the operator could conduct surveillance (Figure 16), disrupt, deny, degrade, or destroy information resident in computers and computer networks or the computers and networks themselves⁵⁹. Inclusion of this Commercial Off The Shelf (COTS) equipment, with minor alteration for military use, in an IO module would be of insignificant cost.

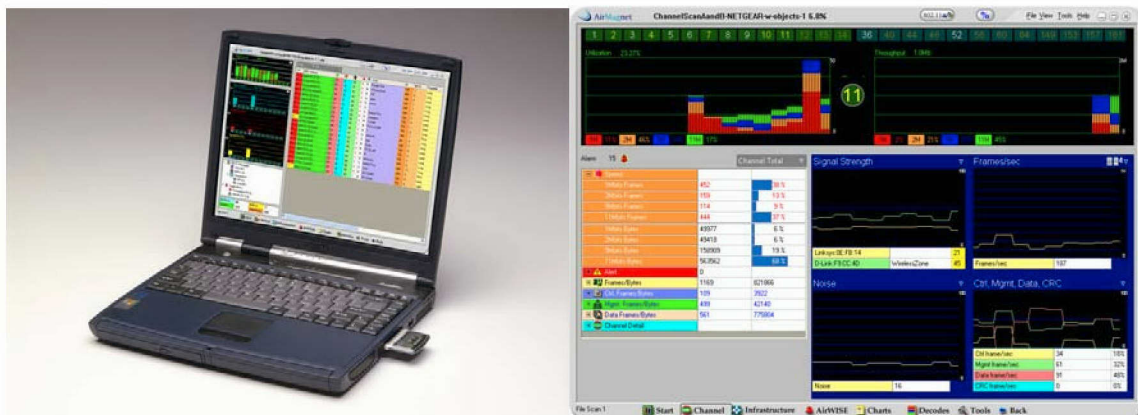


FIGURE 16. EXAMPLE OF AIR MAGNET IN LAPTOP FORM AND SCREEN EXAMPLE OF AIR MAGNET MONITORING WLAN⁶⁰

⁵⁹ JP 3-13. I-9.

⁶⁰ Available from Air Magnet Corporation website. URL: http://www.airmagnet.com/news/image_library.htm. Accessed 15 February 2005.

V. IO DOCTRINE REVIEW

The approval chain for PSYOP [psychological operations] should be as short and streamlined as possible to facilitate timely review, approval, production and dissemination. Although coordination of PSYOP with other staff elements and organizations is absolutely critical in maximizing PSYOP effectiveness, the coordination process should not be so cumbersome as to adversely impact dissemination necessary to achieve the intended effect.

CJCSI 3110.05B, Joint Psychological Operations
Supplement to the Joint Strategic
Capabilities Plan FY 1998

A. INTRODUCTION

With the introduction of the LCS and SPARTAN SCOUT there will once again be a divide between technology and doctrine. The current doctrine governing IO mission approval will not allow JFC's the ability to use the LCS and SPARTAN SCOUT to their full potential. Under current IO doctrine the use of the suggested equipment in chapters III and IV would not be able to be utilized in many rapidly developing or changing IO missions in a high paced operational environment. To illustrate this limitation created by IO doctrine this chapter will provide a historical account for a technology and doctrine mismatch and an objective and doctrine mismatch. It will discuss how the wrong doctrine in a fast paced information age as we are now in can produce devastating results. This chapter will provide examples of the approval process governed by current joint IO doctrine and current PSYOP doctrine to illustrate the time consuming complexity of the process.

B. CULTURE-BOUND HISTORY

This mismatch between technology and doctrine is not a new phenomenon. Looking back in history there are many examples as to how outdated doctrine caused significant advances in technology to be disregarded. In the mid 1800's as the U.S. Navy was beginning to experiment with steam as a prime mover for ships the USS Wampanoag was built. The Wampanoag was commissioned in 1868, she measured 355 feet on the waterline; her beam was 45.2 feet; she displaced 4200 tons and was able to maintain a speed of almost 18 knots.⁶¹ For her time she was heavily armed, of good size and maintained a speed 3 knots faster than any other ship on the water. During sea trials she handled well in heavy seas, maneuvered well and according to special observers of the Secretary of the Navy she was steady, efficient and easy.⁶² Despite how revolutionary and well built the Wampanoag was she was cursed by a culture bound by sailing doctrine.

In 1869, one year after commissioning, the Wampanoag found herself under review by a board of naval officers appointed by the Secretary of the Navy to report on all steam vessels in the Navy.⁶³ According to the boards findings found in U.S. Document 1411 of the 41st Congress, 2nd session:

The steam vessel was not a school of seamanship for officers or men. Lounging through the watches of a steamer, or acting as fireman and coal heavers, will not produce in a seaman that

⁶¹ Elting E. Morison. Men Machine and Modern Times, The Massachusetts Institute of Technology. Cambridge Mass. 1966. p 98-99.

⁶² Ibid., 115.

⁶³ Ibid., 114.

combination of boldness, strength, and skill which characterized the American sailor of an elder day; and the habitual exercise by an officer, of a command, the execution of which is not under his own eye, is a poor substitute for the school of observation, promptness and command found only on the deck of a sailing vessel.⁶⁴

The board concluded that the Wampanoag was a sad failure, utterly unfit to be retained in the service, and that she was so much of an abortion no amount of changes could be made to improve her.⁶⁵ Because the culture of the time was driven by doctrine for sailing vessels the Wampanoag was placed in lay up and some years later sold out of the Navy.

Another example of this technology doctrine mismatch involves the development of the B-10 and B-17 bombers by the U.S. Army Air Corps in the early 1930's. At the time of the B-10 and B-17 development the current doctrine derived from WWI was that bombers would be escorted by fighters for defensive purposes. The problem with the B-10 and B-17 bombers was that their design allowed them to fly faster and further than the available fighters that would provide escort.⁶⁶ Because of this culture the fixed perception was that bombers would have fighter escorts and despite prevailing Army Air Corps doctrine that indicated the majority of interceptor attacks could be expected to

⁶⁴ Morison, *Men Machine and Modern Times*. 98-99.

⁶⁵ *Ibid.*, 115.

⁶⁶ Irving B. Holley, *Technology and Military Doctrine: Essays on a Challenging Relationship*. Air University Press, Maxwell AFB, AL. August 2004. 80-81.

approach within a 30 degree cone aft of the tail, the B-10 and B-17 were designed without tail guns.⁶⁷

Once the B-17 was in production change to the design did not come easy for the bombers. Despite congressional prodding of the Army Air Corps in 1934 after an appropriations committee noticed the Royal Air Force (RAF) had some 200 bombers with nose and tail guns it wasn't until the grim realities of WWII that the B-17 was outfitted with nose and tail guns.⁶⁸

The fact that the LCS is being developed without concern for IO related missions causes fear that it may follow in the foot steps of these historical examples. Like the Wampanoag with a technology and doctrine mismatch the LCS may be discarded. At best if the LCS is developed without planning for supporting IO missions it may be similar to the B-17 where change was difficult to implement.

C. COLD WAR DOCTRINE

Similar to the historical examples for a mismatch between doctrine and technology the current "war on terror" illustrates a mismatch between doctrine and objectives. Akin to the doctrine mismatch with technology this doctrine mismatch with objectives would limit the use of the LCS and SPARTAN SCOUT if outfitted with IO modules.

In September of 2004, a Defense Science Board Task Force submitted their report on Strategic Communications to

⁶⁷ Holley, Technology and Military Doctrine: Essays on a Challenging Relationship. 80

⁶⁸ Ibid., 81

the Secretary of Defense. According to this report Strategic Communications can be understood to embrace four core instruments: public diplomacy, public affairs, international broadcasting services and information operations.⁶⁹ As the task force's definition of 'strategic communications' includes IO, their findings and recommendations effect current and future doctrine that is and will be applied to the LCS and SPARTAN SCOUT IO modules.

According to I.B. Holley, a Duke University History professor and retired Air Force Major General, "The essence of doctrine is that it springs from recorded past experience- the hard-won lessons of the past whether that experience is by one's own forces in actual combat, the recorded participation of foreign forces in combat, or experience derived from extensive peacetime maneuvers and exercises."⁷⁰ The DSB task force found that when the U.S. government was faced with a new conflict (the war on terror,) because the Cold War template (doctrine) proved so effective a decade prior to September 11, 2001, without thought or care as to whether these were the best responses, made their decision based on this outdated doctrine.⁷¹ According to the DSB report, the following are reasons we need to move beyond outdated concepts, stale structural models, and institutionally based labels from Cold War doctrine:

⁶⁹ Defense Science Board (DSB) Task Force, "Strategic Communications." (Washington DC: Government Printing Office, September 2004) 12-13.

⁷⁰ Holley, Technology and Military Doctrine: Essays on a Challenging Relationship. 80.

⁷¹ Solt, "Strategic Communications," 34.

The Cold War emphasized dissemination of information to "huddled masses yearning to be free." Today we reflexively compare Muslim "masses" to those oppressed under Soviet rule. This is a strategic mistake. There is no yearning-to-be-liberated-by-the-U.S. ground swell among Muslim societies – *except to be liberated perhaps from what they see as apostate tyrannies that the U.S. so determinedly promotes and defends.*

The Cold War emphasized an enduringly stable propaganda environment. The Cold War was a status quo setting that emphasized routine message-packaging – and whose essential objective was the most efficient enactment of the routine. In contrast the situation in Islam today is highly dynamic, and likely to move decisively in one direction or another. The U.S. urgently needs to think in terms of promoting actual positive change.

The Cold War emphasized an acceptance of authoritarian regimes as long as they were anti-communist. This could be glossed over in our message of freedom and democracy because it was the main adversary only that truly mattered. Today, however, the perception of intimate U.S. support of tyrannies in the Muslim World is perhaps the critical vulnerability in American strategy. It strongly undercuts our message, while strongly promoting that of the enemy.⁷²

D. FAST PACED INFORMATION AGE

Like the dramatic effects the technology doctrine mismatch had on the Wampanoag and B-17 bomber this objective doctrine mismatch has produced dramatic results in the U.S. "War on Terror". The DSB report points out that often the first information to reach an audience (a global audience that is really a galaxy of niche audiences)

⁷² Solt, "Strategic Communications," 36.

frames how an event is perceived and discussed - and thus can shape its ultimate impact.⁷³ With the speed at which information regarding an event can be broadcast world wide, if the U.S. wants to have a chance in having its facts about the event to be accepted then they must act quickly. The DSB report shows how with technologies such as Arab satellite TV, cell phones, wireless handhelds, videophones, camcorders, digital cameras, miniaturized fly away units used by TV crews in remote locations, high resolution commercial space imaging, blogs, and email the world is becoming more transparent.⁷⁴ Countering the speed at which the Arab media is using these technologies to create the frames within which people understand and misunderstand events and U.S. political goals is an area where the U.S. is failing.⁷⁵ A June 2004 Zogby⁷⁶ poll of Arab opinion shows the audience receptive to the U.S. message is miniscule (Table 2).

⁷³ Solt, "Strategic Communications," 38.

⁷⁴ Ibid., 19.

⁷⁵ Ibid., 19.

⁷⁶ Zogby International has been tracking public opinion since 1984 in North America, Latin America, the Middle East, Asia, and Europe in order to Offer the Best Polling, Market Research, & Information Services Worldwide Based on Accuracy & Detailed Strategic Information.

Country	June 2004 Favorable/ Unfavorable	April 2002 Favorable/ Unfavorable
Morocco	11/88	38/61
Saudi Arabia	4/94	12/87
Jordan	15/78	34/61
Lebanon	20/69	26/70
UAE	14/73	11/87
Egypt	2/98	15/76

TABLE 2. RESULTS OF JUNE 2004 ZOGBY POLL
(RESULTS IN PERCENTAGES)⁷⁷

E. OVERVIEW OF IO PLAN APPROVAL

As in other warfare areas IO has guidance for deliberate and crisis planning. In both types of planning there are several layers of review, deconfliction, and approval. Table 4 illustrates the time consuming steps involved in deliberate planning while Table 3 shows the somewhat abbreviated process for crisis planning.

⁷⁷ Solt, "Strategic Communications," 44.

INFORMATION OPERATIONS PLANNING RELATED TO CRISIS ACTION PLANNING			
PLANNING PHASE	JOPEs	IO CELL PLANNING ACTION	IO PLANNING OUTCOME
PHASE I	Situation Development	IO cell identifies planning information requirements as situation develops.	Tasking to gather/obtain required information.
PHASE II	Crisis Assessment	IO cell identifies information requirements needed for mission planning. IO cell assists in development of combatant commander's IO planning guidance to support overall operational planning guidance.	IO planning guidance. Initial liaison with units and agencies that may participate in or support IO operations.
PHASE III	Course of Action Development	IO cell supports the development of intelligence, operations, and communications staff estimates.	IO portion of staff estimates.
PHASE IV	Course of Action Selection	IO cell assists in transforming staff estimates into the Commander's Estimate. IO cell assists in the IO aspect of Combatant Commander's Concept as required.	IO portion of overall plan approved through CJCS.
PHASE V	Execution Planning	IO cell develops the complete IO plan and the plans for each of the IO elements in coordination with appropriate staff sections, operational units, and supporting agencies.	Approved offensive and defensive appendices with element tabs, completed supporting plans, and inclusion of IO requirements in TPFDD.
PHASE VI	Execution	IO cell monitors IO operations and adapts IO objectives to support changing operational directives.	IO objectives modified as necessary to support changing operational objectives.
CJCS = Chairman of the Joint Chiefs of Staff IO = Information Operations TPFDD = Time-Phased Force and Deployment Data			

TABLE 3. IO CRISIS PLANNING PROCESS⁷⁸

Important to note from both Tables 3 and 4 is the CJCS requirement for approval through the CJCS for IO missions. The inclusion of this step, while necessary, significantly increases the time required to gain approval for an IO plan.

⁷⁸ JP 3-13., V-7.

INFORMATION OPERATIONS PLANNING RELATED TO DELIBERATE PLANNING			
PLANNING PHASE	JOPEs	IO CELL PLANNING ACTION	IO PLANNING OUTCOME
PHASE I	Initiation	Notify IO cell members of planning requirements.	N/A
PHASE II	Concept Development		
Step 1	Mission Analysis	IO cell identifies information requirements needed for mission planning.	Tasking to gather/obtain required information.
Step 2	Planning Guidance	IO cell assists in development of combatant commander's IO planning guidance to support overall operational planning guidance.	Combatant commander's planning guidance for IO.
Step 3	Staff Estimates	IO cell supports the development of intelligence, operations, and communications staff estimates.	IO portion of staff estimates.
Step 4	Commander's Estimate	IO cell assists in transforming staff estimates into the Commander's Estimate.	IO portion of Commander's Estimate.
Step 5	Combatant Commander's Concept	IO cell assists in the IO aspect of Combatant Commander's Concept as required.	IO portion of Combatant Commander's Concept.
Step 6	CJCS Concept Review	IO cell assists in the IO aspect of CJCS Concept Review as required.	IO portion of operational concept approved by CJCS.
PHASE III	Plan Development	IO cell develops the complete IO plan and the plans for each of the IO elements in coordination with appropriate staff sections, operational units, and supporting agencies.	Draft offensive and defensive IO appendices with element tabs.
PHASE IV	Plan Review	IO cell modifies / refines plan as necessary.	Approved offensive and defensive IO appendices.
PHASE V	Supporting Plans	Subordinate units and supporting agencies prepare their own IO plans. IO cell coordinates/assists subordinate and supporting IO plan as necessary. Ensure TPFDD supports IO plan.	Completed subordinate and supporting agencies' supporting plans. IO plan supported by TPFDD.
CJCS = Chairman of the Joint Chiefs of Staff IO = Information Operations TPFDD = Time-Phased Force and Deployment Data			

TABLE 4. IO DELIBERATE PLANNING PROCESS⁷⁹

F. JOINT PSYOP APPROVAL PROCESS

Similar to the Joint IO approval process, the Joint PSYOP approval process is complex and time consuming as well. Figure 17 shows the process for getting a PSYOP

⁷⁹ JP 3-13. V-8.

program approved, while Figure 18 shows all the steps necessary to approve a product for an approved PSYOP program.

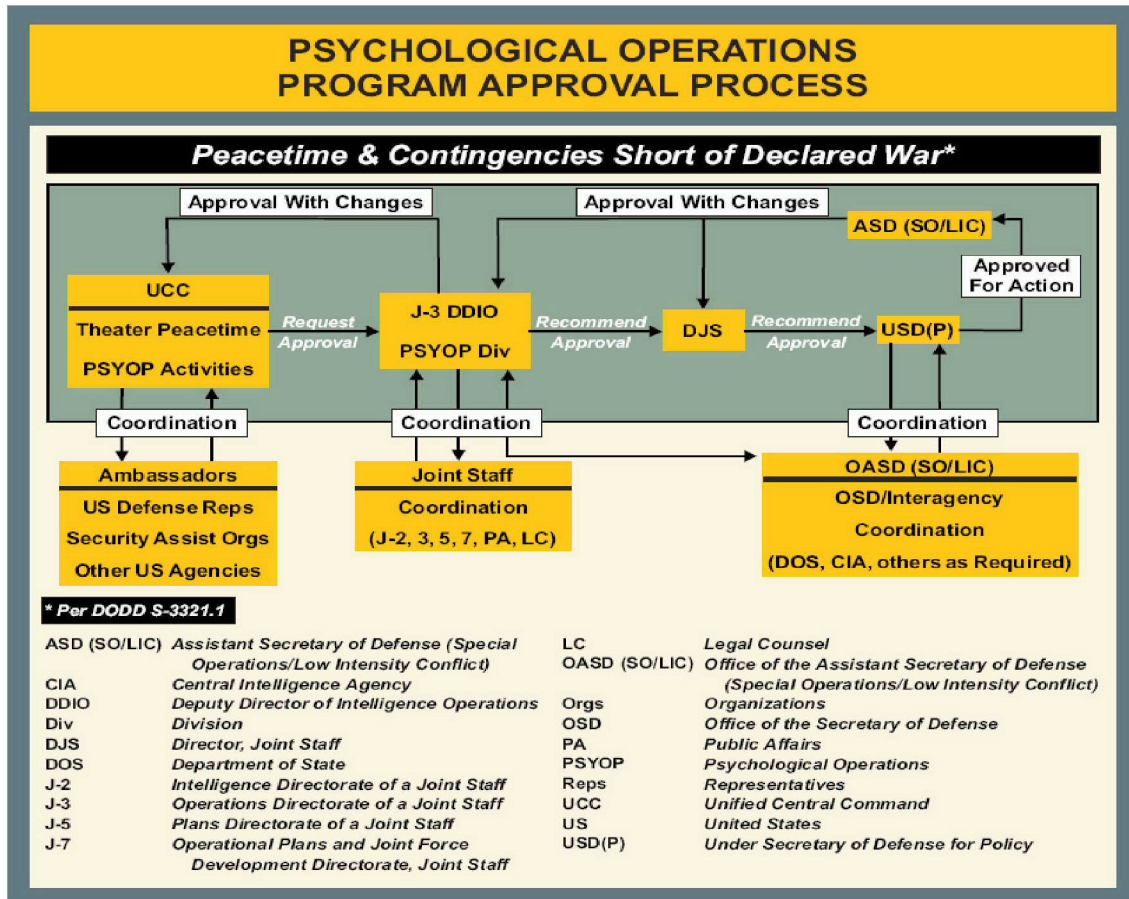


FIGURE 17. PROCESS TO GAIN APPROVAL FOR A JOINT PSYOP PROGRAM⁸⁰

⁸⁰ JP3-53., V-4.

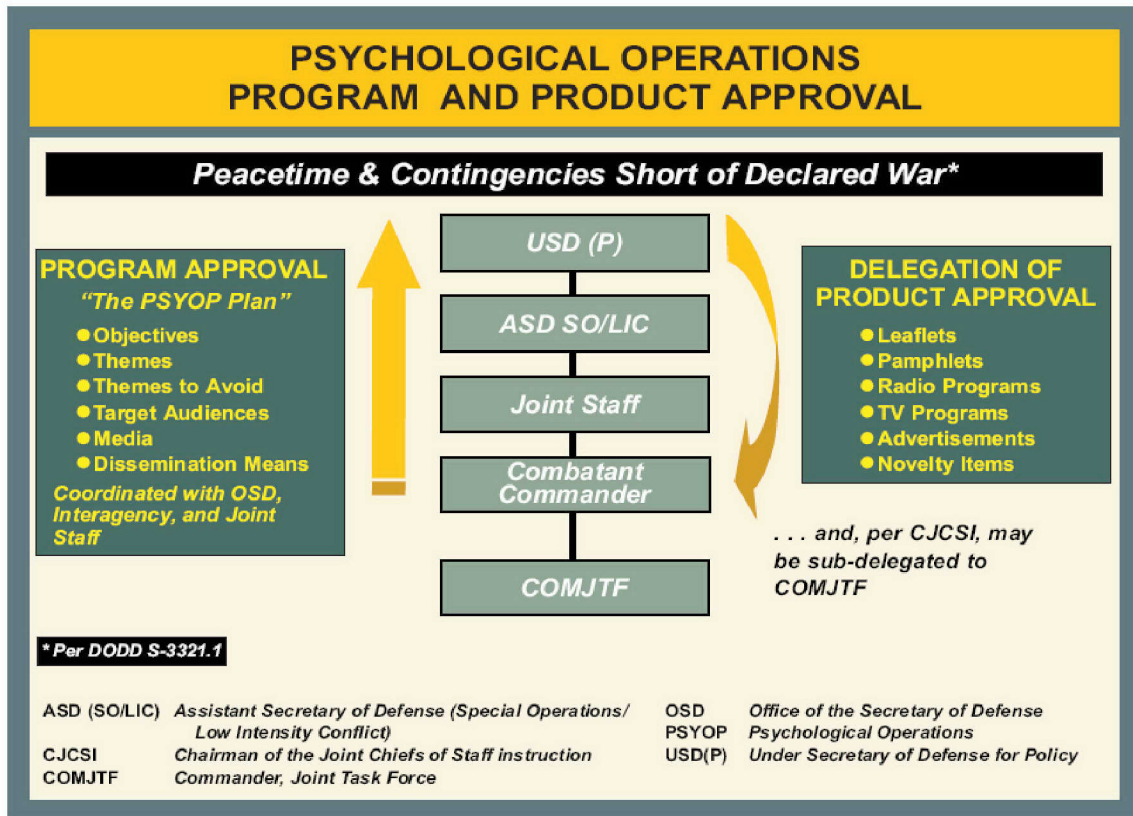


FIGURE 18. PROCESS TO GAIN APPROVAL FOR PRODUCTS TO BE PRODUCED FOR AN APPROVED PSYOP PROGRAM⁸¹

G. SUGGESTIONS FOR REVISED IO DOCTRINE

While current IO doctrine does include pre-planned and pre-approved IO missions as part of Operational Plans (OPLANS), these annexes must be detailed enough to include pre-approval and possible production of material (leaflets and taped radio and TV broadcasts) that may be used through all phases of the conflict. In addition to having detailed IO missions and material approved prior to hostilities, there must be a revision in IO doctrine to allow the flexibility to make quick adjustments to the overall mission as unexpected events occur or as the situation

⁸¹ JP 3-53., V-5.

changes. This concept of doctrine providing flexibility is not a revolutionary concept.

In this post September 11, 2001 society there has been several changes made in the military and government agencies where greater authority has been given to commanders in order reduce time consuming approval chains. One such example is that of an "execute order" that the Washington Post wrote about in a February 2005 article "Pentagon Seeking Leeway Overseas: Operations Could Bypass Envoys". According to the article, the Pentagon is seeking the authority to place Special Forces into countries without the approval of the countries ambassador, thus reducing the time required to launch counterterrorism missions.⁸² The IO community should embrace this concept of reducing the approval process and revise their doctrine so that the U.S. can quickly respond to world events.

⁸² Ann Scott Tyson and Dana Priest, "Pentagon Seeking Leeway Overseas: Operations Could Bypass Envoys," Washington Post, 24 February 2005, sec. A, p. 1.

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VI. CONCLUSION

Master the mechanics and techniques; understand the art and profession; and be smart enough to know when to deviate from it.

GEN Zinni, CENTCOM

A. TRUE TRANSFORMATION

According to direction in *Transformation: A Strategic Approach*, the four Military Transformation Pillars identified by the Secretary of Defense include strengthening joint operations, exploiting U.S. intelligence advances, concept development and experimentation, and developing transformational capabilities (Figure 19).

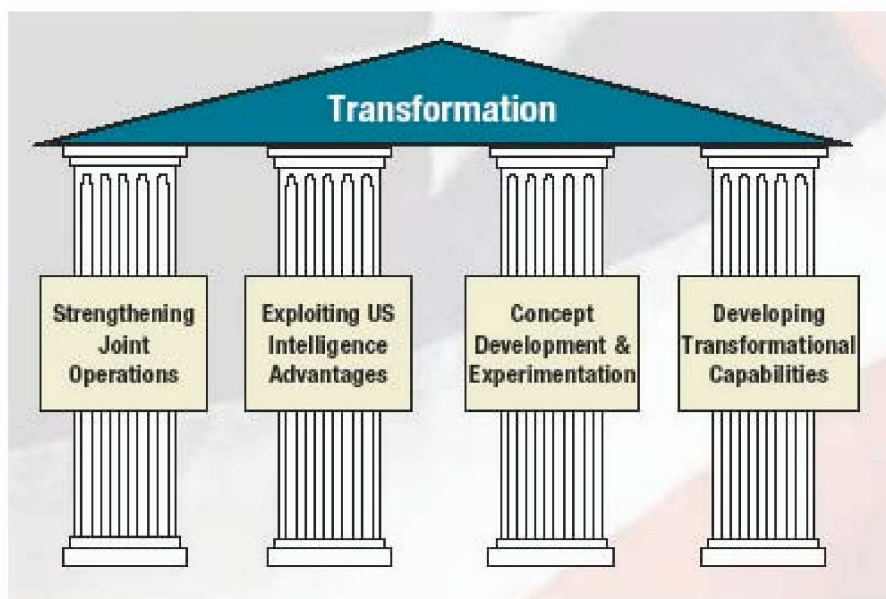


FIGURE 19. FOUR PILLARS OF MILITARY TRANSFORMATION⁸³

⁸³ Director, Force Transformation. *Transformation a strategic approach* (Washington DC: U.S. Government Printing Office, 2003), 20.

As mentioned in Chapter II, the concept to produce the LCS that was agreed to by congress was that the LCS would be a transformational platform. While the current configuration does meet the criteria to be classified transformational, as of September 2004, while conducting research for this thesis there had been no attention paid to the use of the LCS in IO missions. The inclusion of an IO module with the joint manning outlined in Chapter III, would provide further justification for continued funding and development of the LCS class. The technology required to develop an IO module is currently being employed in other areas; as such the cost to develop the module would be minimal. As discussed in Chapter III, an IO module on the LCS would provide enormous benefits to the joint force commander and the IO mission as well as providing advantages no other platform currently does.

As of February 2005, there appeared to be progress in the development of IO capabilities for the LCS. There is a draft LCS concept of operations (CONOPS) being circulated that does provide hope for the inclusion of IO in the development of the LCS. This draft CONOPS is being developed through collaboration between the following DoD organizations: Commander Fleet Forces Command, Commander Naval Surface Forces Pacific, Commander Naval Surface Forces Atlantic; Chief of Naval Operations N61, N75, N76, N77, N78; Commander Mine Warfare Command; Commander Undersea Surveillance; Network Warfare Command; Navy Warfare Development Command; Fleet Information Warfare Command; Program Executive Office (PEO) Ships; PEO Littoral and Mine Warfare; PEO (C4I), PEO Integrated Warfare Systems; Naval Sea Systems Command 03 and 06; Naval Air

Systems Command; Naval Special Warfare Command; PMS 501; Surface Warfare Development Group; Fleet Collaborative Team and the Mission Systems and Ship Integration Team.⁸⁴ According to this collaborative draft CONOP, "LCS has core and focused mission systems that provide some ISR/IO capability, however, a separate ISR mission package can provide additional ISR capabilities."⁸⁵ In section 6.4.4.1 the draft CONOP goes on to say:

LCS will conduct IO as an inherent mission capability. IO missions appropriate for LCS include Influence Operations, Communications Electronic Attack (EA) and Computer Network Operations. For precursor operations, the ISR/IO mission package is envisioned for use in IPB. The IO mission will take advantage of the capability of LCS networking to perform distributed computing and time critical coordination of assets using core LCS workstations that can be easily configured for the IO mission. LCS is part of the federated process of sensor analysis. Previous ISR sensor data discussion in this section is germane to the IO mission. If analysis or processing of sensor data is not required on LCS, then a SCI facility may not be required.

Influence Operations: As part of the ISR/IO inherent mission capability, LCS may have mobile broadcast capabilities. LCS may also be the conduit for limited-production and robust dissemination of influence products, including the receipt of audio, video and images for turn around into radio broadcasts.

Communications EA: LCS will be able to engage a specified range of non-kinetic targets in the littoral, independently or cooperatively (with other LCS or other platforms). This includes the use of core communications systems and antennas

⁸⁴ "Collaborative Draft LCS CONOP" (working paper of government LCS design team, August 2004). VIII-IX.

⁸⁵ Ibid., 35.

in Electronic Support (ES) and as a time-difference of arrival node for ES, EA and geo-location of emitters. The preferred employment is dual use of LCS communications systems for both connectivity and ES/EA missions; however, a mobile cryptologic sensor package will be available for expanded ES tasking. As an ES/EA node, LCS will be part of a larger Joint targeting process that incorporates integrated kinetic and non-kinetic target engagement. EA tasking may include support for time critical targeting.⁸⁶

It appears that if this draft CONOP does become the official guidance for the LCS, the sea frame will have IO assets as well as IO module. If this draft CONOP is made into doctrine and used for the development the LCS may avoid the ill fate of the Wampanoag and avoid the difficult adjustment process the B-17 had to go through as discussed in Chapter V.

Unlike the LCS, throughout the writing of this thesis SPARTAN SCOUT development and discussions have not addressed the integration of IO tools. However, as mentioned in Chapter II there is competition in USV development within the Navy. Unlike the competition between General Dynamics and Lockheed Martin for the future of LCS where the modules for each companies LCS must be interchangeable, there are no such restrictions between ONR's USSV and NUWC's SPARTAN SCOUT. If NUWC were first to develop an IO module for their SPARTAN SCOUT it would only provide further justification for continued funding and development.

⁸⁶ "Collaborative Draft LCS CONOP", 37-38.

B. SUGGESTED FURTHER RESEARCH

If this draft CONOP is accepted as doctrine, it appears the LCS is moving in the right direction with regards to IO. The SPARTAN SCOUT should embrace the development of an IO module out of self preservation. The one area that requires further research is that of doctrine. After September 11, 2001, there have been numerous task forces assigned to conduct reviews over the various U.S. intelligence communities. Several of these task force recommendations have all ready been addressed throughout this thesis. However, one area of further research that should be explored is provided by the DSB taskforce on Strategic Communications. According to the task force:

We recommend that the Under Secretary of Defense for Policy and the Joint Chiefs of Staff ensure that all military plans and operations have appropriate strategic communication components, ensure collaboration with the Department of State's diplomatic missions and with theater security cooperation plans; and extend U.S. STRATCOM's and U.S. SOCOM's Information Operations responsibilities to include DoD support for public diplomacy. The Department should triple current resources (personnel & funding) available to combatant commanders for DoD support to public diplomacy and reallocate Information Operations funding within U.S. STRATCOM for expanded support for strategic communication programs.⁸⁷

This recommendation to change IO doctrine to include closer collaboration with the Department of State and the support of public diplomacy could further complicate and delay the approval process for IO related materials. A concern with

⁸⁷ Solt, "Strategic Communications," 9.

this DSB task force recommendation is that the suggestion for collaboration with the Department of State may evolve into a requirement for State Department approval or concurrence for all IO missions. While it is important for the correct message to be conveyed on the battle field as discussed in Chapter V, in order for an influence campaign to be effective in this fast paced global society the U.S. must act fast and ideally be first to get their message out and accepted.

LIST OF REFERENCES

- Abbott, Rob. *LCS Mission Package Manning Overview*. (Washington DC: PEO Ships, 2005).
- Abrams, Michael. "The Dawn of the E-bomb", IEEE Spectrum (November 2003)
- Air Magnet Website. Available from URL:
http://www.airmagnet.com/news/image_library.htm. Accessed 15 February 2005.
- Altshuler, Herbert L. United States Army Civil Affairs and Psychological Operations Command. Available from URL:
<http://www.soc.mil/usacapoc/psyopfs.shtml>. Accessed 23 February 2005.
- American Forces Information Services website. Available from URL:
<http://www.iwar.org.uk/psyops/resources/afghanistan/command-o-solo.htm>. Accessed 17 February 2005.
- American Technology Corporation. "LRAD: The Sound of Force Protection", Available from ATC website.
URL:<http://www.atcsd.com>. Accessed 15 February 2005.
- Bingle, Bruce. "67th IOW Crystallizes Operations" Available from URL:
<http://aia.lackland.af.mil/homepages/pa/spokesman/jun04/cc.cfm>. Accessed 23 February 2005.
- Beavers, Sara. "24 MEU Conducts Non-lethal Training During TRUEX" Marine Link, May 2004. Available from URL:
<http://www.marines.mil/marinelink/mcn2000.nsf/lookupstoryref/2004525152639>. Accessed 19 February 2005.
- Caspers, Robert W. *Joint Task Force South in Operations Just Cause, An Oral History Interview*. (Washington DC: U.S. Army Center of Military History, 1990).
- Chairman of the Joint Chiefs of Staff. (1998). *Joint Pub 3-13 Joint Doctrine for Information Operations*. Washington DC: U.S. Government Printing Office.

Chairman of the Joint Chiefs of Staff. (2003). *Joint Pub 3-53 Joint Doctrine for Psychological Operations*. Washington DC: U.S. Government Printing Office.

Defense Science Board (2004) Report of the Defense Science Board Task Force on Strategic Communications. (Washington DC: Office of the Under Secretary of Defense for Acquisition, Technology and Logistics).

Defense Service Board. (2000). *Report of the Defense Science Board Task Force on The Creation and Dissemination of All Forms of Information in Support of Psychological Operations (PSYOP) in Time of Military Conflict*. (Washington, D.C.: Office of the Under Secretary of Defense for Acquisition, Technology and Logistics).

Director, Force Transformation. *Transformation a Strategic Approach* (Washington DC: U.S. Government Printing Office, 2003).

Federation of American Scientists website. Available from URL:<http://www.fas.org/irp/agency/navsecgru/niwa/>. Accessed 23 February 2005.

Holder, Pat. "SPARTAN SCOUT ACTD Unmanned Surface Vessel for Assured Access and Force Protection" (presentation presented at Logistics from the Sea Symposium, Washington DC, 4-7 February 2003).

Holley, Irving B. *Technology and Military Doctrine: Essays on a Challenging Relationship*. Air University Press, Maxwell AFB, AL. August 2004.

Jackson, Joab. "Pentagon Backs Spiral Development." Washington Technology, 9 June 2003. Database on-line. Available from Washington Technology website at URL:http://www.Washingtontechnology.com/news/18_5/cover-stories/20872-1.html. Accessed 3 February 2005.

"LCS CONOP (Draft)" (working paper of government LCS design team, August 2004).

LCS homepage, Available from: www.peos.crane.navy.mil/lcs/Lockheed.htm. Accessed 4 February 2005.

Morison, Elting E. *Men Machine and Modern Times*, The Massachusetts Institute of Technology. Cambridge, Massachusetts. 1966.

Naval Sea Systems, "Capability Development Document for Littoral Combat Ship" (working paper of government LCS design team, April 2004).

Naval Sea Systems, "Draft (ICD) Interface Control Document" (working paper of government LCS design team, 13 September 2004).

Naval Undersea Warfare Command Public Affairs Officer, "Spartan Deployed on Gettysburg," Navy News Stand, 23 December 2003. Available from URL: http://www.news.navy.mil/search/display.asp?story_id=10964. Accessed 19 February 2005.

Naval Undersea Warfare Command, "SPARTAN SCOUT ACTD Management Plan Rev 1" (Working paper for SPARTAN SCOUT design team, 14 March 2003).

ONR Future Naval Capabilities website. URL: <http://www.onr.navy.mil/fncs/explog/litcom/product.asp?productid=65&divisionid=5>. Accessed 2 February 2005.

Pawley, Jason. "Littoral Combat Ship: Overview" (Presented at Menneken Lecture Series, Naval Postgraduate School, Monterey, California, 19 August 2004).

PSYWARRIOR website. URL: <http://www.psywarrior.com>. Accessed 15 February 2005.

Ricci, Dr. Vic. interview by author, Newport, RI. 24 September 2004.

Rumsfeld, Donald. *Quadrennial Defense Review*. (Washington DC: Government Printing Office, 2001).

Secretary of the Air Force. Information Operations AFDD 2-5 (Washington DC: U.S. Government Printing Office, January 11, 2005)

Schamiloglu, E. "High Powered Microwave Sources and Applications". IEEE MTT-S Digest, (2004).

Solt, John. "Psychological Operations Go to Sea" FIWC INFOSCOPE Winter 2003, Volume 2, Issue 1. Available from FIWC website at URL: http://www.infoscope.fiwc.navy.smil.mil/vol2_issue2/index.htm. Accessed 12 October 2004.

Surface Warfare Magazine, Summer 2004, Vol 29, No 3.

Thompson, Mark. "America's Ultra-Secret Weapon". Time, (January 27, 2003. Volume 161 Number 4).

Tyson, Ann Scott and Dana Priest, "Pentagon Seeking Leeway Overseas: Operations Could Bypass Envoys," Washington Post, 24 February 2005, sec. A, p. 1.

U.S. Department of Defense, Office of the Secretary of Defense, Final Report to Congress Conduct of the Persian Gulf War, April 1992.

Washington Times, "U.S. Troops Have Sound Weapon," 7 March 2004. Available from URL: <http://www.washingtontimes.com/archive/>. Accessed 19 February 2005.

Work, Robert O. "Naval Transformation and the Littoral Combat Ship" (Center for Strategic and Budgetary, working paper of government LCS design team, 2004).

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